

What is claimed is:

- 1 1. In apparatus, in the dissipation of heat through a surface area of a component of said apparatus, the improvement comprising :
 - 3 a first transfer of said heat radiating from said surface area of said component to a liquid medium comprising liquid passageways in a component in contact with said surface area, and,
 - 5 a subsequent transfer of said heat in said liquid medium to a gaseous medium.
- 1 2. The improvement of claim 1 wherein said a subsequent transfer of said heat in said liquid medium to a gaseous medium includes said gaseous medium conveying said transferred heat and radiated heat from said apparatus to an ambient outside said apparatus.
- 1 3. The improvement of claim 1 wherein said component in contact with said surface area has at least one serpentine shaped passageway.
- 1 4. The improvement of claim 3 wherein said serpentine passageway is a plurality of said passageways resulting from top and bottom plates each with a protruding interdigitating pathway configurations.
- 1 5. The improvement of claim 2 wherein said component in contact with said surface area has at least one serpentine shaped passageway.
- 1 6. The improvement of claim 4 wherein said serpentine passageway is a plurality of

2 said passageways resulting from top and bottom plates each with a protruding
3 interdigitating pathway configurations.

1 7. The improvement of claim 4 where said component includes an embedded pump at a
2 site connected to said at least one serpentine pathway.

1 8. The improvement of claim 6 where said component includes an embedded pump at
2 site joining four serpentine pathways at a pump site.

1 9. In the dissipation of heat through a surface area of an integrated circuit
2 in electronic apparatus,
3 the improvement comprising :
4 a transfer component for transfer of said heat radiating from said surface area of said
5 integrated circuit to a liquid medium
6 said transfer component including a member in contact with said surface
7 having passageways for a liquid medium.

1 10. The improvement of claim 9 including a heat exchanger adapted to transfer said heat
2 through a gaseous medium to an ambient of said electronic apparatus.

1 11. The improvement of claim 10 wherein said transfer of said heat in said
2 liquid medium to a gaseous medium includes said gaseous medium conveying said
3 transferred heat and radiated heat from said apparatus to an ambient outside said
4 apparatus.

1 12. In the dissipation of heat through radiating surface areas of integrated circuits
2 in electronic apparatus,
3 the improvement comprising :
4 a transfer component for transfer of heat radiating from the radiating surface area of said
5 integrated circuits to a liquid medium,
6 said transfer component having first and second essentially parallel sides with
7 the radiating surface area of each integrated circuit of an array in contact with
8 one of said sides,
9 said transfer component including a heat exchanger adapted to transfer said heat
10 through a gaseous medium to an ambient of said electronic apparatus.

1 13. The improvement of claim 12 wherein said transfer of said heat in said
2 liquid medium to a gaseous medium includes said gaseous medium conveying said
3 transferred heat and radiated heat from said apparatus to an ambient outside said
4 apparatus.

1 14. The process of transfer of heat from an area of densely positioned sources radiating
2 through a planar surface of an element of an electronic apparatus,
3 comprising the steps of:
4 providing a radiation to liquid heat transfer component positioned in contact with said
5 area on said surface, and,
6 providing a heat exchange mechanism operable to transfer heat in the liquid in said

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7 transfer component to a gas.

1 15, The process of claim 14 including the step of passing said gas over radiating
2 portions of said apparatus in exhausting said gas to an ambient outside said apparatus.

1 16. The process of claim 14 including in said providing, a radiation to liquid,
2 heat transfer component, positioned in contact with said area on said surface, step,
3 the further providing of multiple serpentine liquid passageways in said component.

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